

# Lenslet-Array, Spatially-Distributed, Self-Phase-Locked Laser Architecture

Completed Technology Project (2015 - 2016)



## Project Introduction

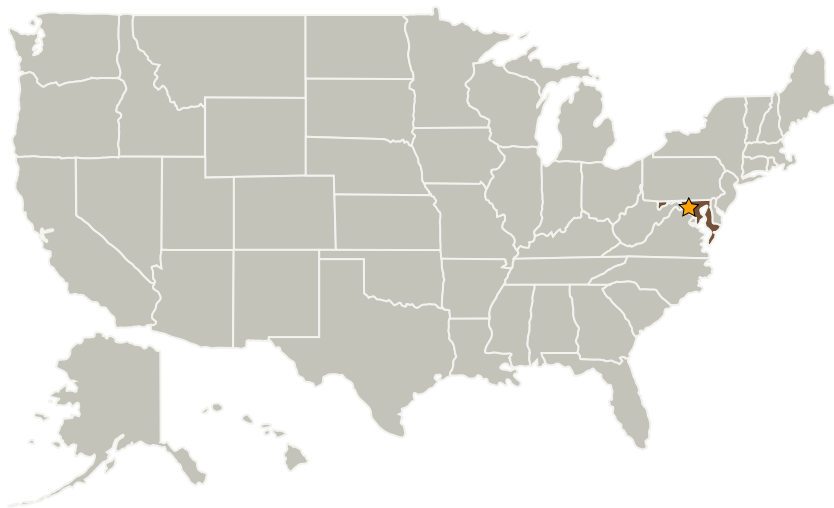
We are developing a novel laser technology to enable coherent beam combination from distributed gain sources. This addresses the most important limitations in laser technology: efficiency, power scaling and wavelength selectivity.

Our goal is to demonstrate a proof-of-concept laser technology that will enable power-scaling using multiple distributed gain sources. We will design, build and characterize a prototype laser distributed elements to demonstrate the concept. This architecture will be widely applicable to almost any laser technology but will have particular benefits for fiber and semiconductor gain media where power scaling is difficult.

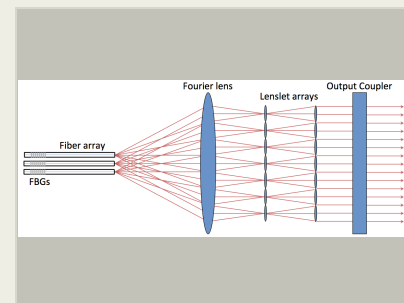
## Anticipated Benefits

This mission could benefit future NASA missions like ASCENDS, LIST.

## Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Goddard Space Flight Center (GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland



Example of a 1-dimensional lenslet array combining light from multiple fiber sources into a laser cavity with a single-mode output beam. (It can easily be extended to 2 dimensions.)

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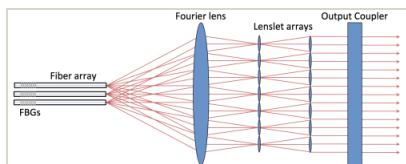
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## Primary U.S. Work Locations

Maryland

## Images



### Untitled

Example of a 1-dimensional lenslet array combining light from multiple fiber sources into a laser cavity with a single-mode output beam. (It can easily be extended to 2 dimensions.)

(<https://techport.nasa.gov/image/19139>)

## Links

GSC-17541-1  
(no url provided)

## Project Website:

<http://aetd.gsfc.nasa.gov/>

## Organizational Responsibility

### Responsible Mission Directorate:

Mission Support Directorate (MSD)

### Lead Center / Facility:

Goddard Space Flight Center (GSFC)

### Responsible Program:

Center Independent Research & Development: GSFC IRAD

## Project Management

### Program Manager:

Peter M Hughes

### Project Manager:

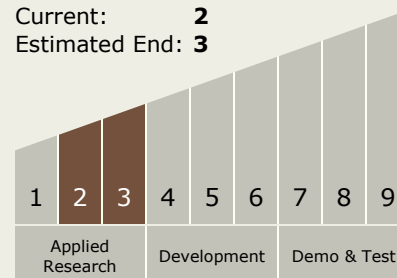
Terence A Doiron

### Principal Investigator:

Mark A Stephen

## Technology Maturity (TRL)

Start: 2  
Current: 2  
Estimated End: 3



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## Technology Areas

### Primary:

- TX08 Sensors and Instruments
  - └ TX08.1 Remote Sensing Instruments/Sensors
    - └ TX08.1.5 Lasers